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"Western Treasure -- Deep, Wet Snow"

FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

RIO GRANDE DRAINAGE BASIN

MARCH 1, 1948

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State and local organizations.

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U. S. DEPARTMENT OF AGRICULTURE

March 1, 1948

Water Supply Outlook

Rio Grande and Canadian Drainage Basins

The water supply outlook for irrigated areas served by the Rio Grande and its tributaries is well above normal for the first time in the past two seasons. Water content of the snow is nearly 25 percent above the past 11-year average. San Luis Valley is snow covered and this condition extends into northern New Mexico. Soil moisture conditions are good over the watershed. Reservoir storage is low on the Chama River and lower Rio Grande and about average in Colorado. Favorable snow conditions exist on the headwaters of the Pecos and Canadian Rivers, but snow measurements on the Chama and Conejos Rivers indicate the possibility of below normal water supply on these streams.

RIO GRANDE

The increase in snow cover during the month of February on the mountains surrounding San Luis Valley was much above average. For the main stem of the Rio Grande above Del Norte the water stored in snow is 77 percent over normal and twice as great as March 1, 1947. This favorable snow storage condition includes the watershed of the Alamosa river, but on the Conejos river a slight deficiency is indicated. At Cumbres Pass the water content of the snow was measured at 12.3 inches as compared to an average of 19.4. Snow cover on streams originating in the mountains to the north and east of the valley is about 25 percent above normal. Soil moisture is reported as good and stream flow above average. Reservoir storage in the valley is twice as much as a year ago.

In northern New Mexico along the Rio Grande the snow cover is just above normal and up to 25 percent over March 1, 1947. In contrast to a year ago precipitation at lower elevation is much above normal and soil moisture is reported as good. February precipitation at Albuquerque is a maximum of record. On the Chama River there is a slight deficiency in snow cover at higher elevations. Storage in El Vado is very low, about five percent of capacity.

The combined storage in Elephant Butte and Caballo reservoirs is down to 565,000 acre-feet as compared to 833,000 a year ago and 1,337,000 on March 1, 1946. However, precipitation in the lower Rio Grande Valley has been above normal and the prospective summer flow is much improved over last year.

On the headwaters of the Pecos near Santa Fe snow water content is nearly three times that of March 1, 1947 and 33 percent above normal. Precipitation in this area has been slightly above normal.

CANADIAN RIVER

On the tributaries to the Canadian River the water stored in snow is now 36 percent above last year and 20 percent above normal. Conchas reservoir has in storage 353,000 acre-feet. A year ago it stored 366,800. Precipitation during February was nearly four times normal. Soil moisture and crop conditions in the Tucumcari area are reported as good.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, MARCH 1, 1948

STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	THOUSANDS OF ACRES FEET IN STORAGE				
			About March 1			10-year Ave. 1937-46	
			1948	1947	1946		
RIO GRANDE	Rio Grande	45.8	22.3	4.8	7.5	20.2	15.2
	Santa Maria	45.0	5.4	4.4	6.7	11.3	9.3
	Sanchez	103.2	8.6	6.1	13.1	10.2	15.9
	Terrace	17.7	5.7	3.2	1.6	3.4	3.6
	Continental	26.7	3.0	1.2	13.1	17.7	7.2
	Elephant Butte	2273.7	416.3	543.7	1070.7	1257.4	1166.7
CHAMA RIVER	Caballo	365.0	149.2	288.9	266.3	297.8	202.5
	El Vado	226.0	7.3	30.6	90.4	91.3	59.3
CANADIAN RIVER	Conchas	600.0	353.1	366.8	341.5	346.9	258.7
PECOS RIVER	Alamogordo	148.0		49.4	29.6	44.4	72.8
	McMillan-Avalon	45.1		7.2	4.2	6.6	17.5

SNOW SURVEYS AND IRRIGATION WATER FORECASTS for

RIO GRANDE BASIN

March 1, 1948

SUMMARY OF MARCH 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS

YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Snow Density			1948 Water Content in	
	Twelve Year Avg.*	1947	1948	Twelve Year Avg.*	1947	1948	Twelve Year Avg.*	1947	1948	percent of Twelve-Year Avg.*	1947
	In.	In.	In.	In.	In.	In.	Percent	Percent	Percent		
Rio Grande	29.8	28.3	37.8	8.1	6.9	9.9	27	24	26	122	143
Upper Rio Grande	39.5	37.6	62.2	10.9	9.3	19.3	27	25	31	177	208
Alamosa River	24.2	28.3	37.5	4.8	5.3	7.1	20	19	19	148	134
Conejos River	45.6	43.1	47.9	13.0	11.2	10.4	29	26	22	80	93
Culebra River	35.4	40.2	38.7	9.3	9.7	11.4	26	24	30	123	118
Chama River	38.9	36.5	37.0	11.6	10.6	9.6	30	29	26	83	91
Rio Taos	21.6	24.5	26.3	6.1	6.0	6.8	28	25	26	111	113
Embudo Creek	32.0	34.0	37.0	7.9	6.8	8.6	25	20	23	109	126
Pecos River	18.7	11.0	28.2	4.8	2.2	6.4	26	20	23	133	291
Canadian River	22.6	26.4	30.5	6.3	5.6	7.6	28	21	25	120	136

*Some for shorter periods

P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation		Departure from Normal		Precipitation*		Departure from Normal	
		October 1 to February 29	Inches	October 1 to February 29	Inches	February	Inches	February	Inches
Canadian	New Mexico								
Rio Grande	Colorado								
Rio Grande (N)	New Mexico		5.65		+0.99		1.33		+0.27
Rio Grande (S)	New Mexico								
Pecos	New Mexico								

*February precipitation tentative

RIO GRANDE DRAINAGE SNOW SURVEYS

March 1, 1948

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COVER MEASUREMENTS				
	No. and State	Sec.	Twp. or Lat.	Range or Long.	Elev.	Date of Survey (Inches)	Water Content (Inches)		Past Record Av. Water Content (Inches)
							1948	1947	
						RIO GRANDE			
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	3/2	27.7	20.0	22.1
Upper Rio Grande	27 "	13	40N	4W	9350	2/28	23.3	5.0	6.7
Silver Lakes	47 "	15	36N	5E	9600	3/2	7.1	5.3	4.8
River Springs	49 "	25	33N	6E	9300	3/1	8.6	6.7	6.5
LaVeta Pass #2	74 "	22	28S	70W	9300	2/27	10.3	8.0	7.3
Summitville	76 "	30	37N	4E	11500			16.1	
Cumbres Pass #2	77 "	17	32N	5E	10900	2/29	12.3	15.8	19.4
Santa Maria	80 "	8	41N	2W	9700	3/1	6.3	3.1	3.9
Culebra	82 "		37.2N	105.2W	10000	2/29	11.4	9.7	9.3
Fort Garland	84 "	13	29N	72W	8200	3/1	4.7	1.3	3.3
Red River	1 N. Mex.	29	28N	15E	9500	3/2	7.7	6.0	8.0
Taos Canyon	2 "	10	25N	15E	9000	2/29	6.8	6.0	6.1
Aspen Grove	4 "	12	18N	10E	9100	3/1	6.1	2.1	4.9
Lee Ranch	5 "	3	18N	4E	9050	3/1	10.5	4.8	7.1
Canjilon	6 "	4	26N	6E	9500	2/29	12.0	15.2	16.1
Hematite Park*	9 "	8	28N	15E	9500	2/29	6.7	4.1	5.5
Tres Ritos	12 "	23	22N	13E	9000	3/1	7.4	5.7	6.2
Pay Role	15 "	16	28N	7E	9700	3/2	11.3	8.8	8.5
Chama Divide	17 "		36.9N	106.7W	7750	2/28	4.8	4.2	5.2
Chamita	18 "		36.9N	106.7W	8500	2/27	7.8	8.8	8.9
Cordova	19 "	22	22N	13E	10100	2/29	9.7	8.0	9.6
Panchuela #2	20 "	27	19N	12E	8300	3/1	5.0	1.6	3.7
Big Tesuque	21 "	17	18N	11E	10000	3/1	8.2	2.8	5.9
Elk Cabin	24 "	8	18N	11E	8250	3/1	6.6	—	6.6
Gallinas	25 "	31	18N	14E	8700	2/29	3.6	—	3.6
			Average for drainage				9.9	6.9	8.1

*On adjacent drainage

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RIO GRANDE DRAINAGE SNOW SURVEYS
March 1, 1948

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COVER MEASUREMENTS							
	NO. and State	Sec.	Twp. or Lat.	Range or Long.	Elev. of Survey	Date of Survey	Snow Depth (Inches)	Water Content (Inches)		Years of Record	Past Record Av. Water Content (Inches)	
								1946	1947			
	RIO GRANDE TRIBUTARIES IN SAN LUIS VALLEY											
UPPER RIO GRANDE												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	3/2	95.4	27.7	20.0	12	22.1	
Upper Rio Grande	27 "	13	40N	4W	9350	2/28	58.5	23.3	5.0	11	6.7	
Santa Maria	80 "	8	41N	2W	9700	3/1	32.8	6.8	3.1	10	3.9	
			Average for drainage				62.2	19.3	9.3		10.9	
ALAMOSA RIVER												
Silver Lakes	47 Colo.	15	36N	5E	9600	3/2	37.5	7.1	5.3	12	4.8	
Summitville	76 "	30	37N	4E	11500		37.5	7.1	16.1	10	4.8	
			Average for drainage				37.5		5.3			
CONEJOS RIVER												
River Springs	49 Colo.	25	33N	6E	9300	3/1	39.2	8.6	6.7	12	6.5	
Summitville	76 "	30	37N	4E	11500		56.6	12.3	15.8	12	19.4	
Cumbres Pass*#2	77 "	17	32N	5E	10000	2/29	47.9	10.4	11.2		13.0	
			Average for drainage									
CULEBRA RIVER												
Culebra	82 Colo.		37.2N	105.2W	10000	2/27	38.7	11.4	9.7	9	9.3	
	RIO GRANDE TRIBUTARIES IN NEW MEXICO											
CHAMA RIVER												
Cumbres Pass #2	77 Colo.	17	32N	5E	10000	2/29	56.6	12.3	15.8	12	19.4	
Canjilon	6N Mex.	4	26N	6E	9500	2/29	34.3	12.0	15.2	11	16.1	
Pay Role	15 "	16	28N	7E	9700	2/2	49.6	11.3	8.8	11	8.5	
Chama Divide	17 "		36.9N	106.7W	7750	2/28	14.3	4.8	4.2	9	5.2	
Chamita	18 "		36.9N	106.7W	8500	2/27	30.3	7.8	8.8	8	8.9	
			Average for drainage				37.0	9.6	10.6		11.6	

*On adjacent drainage

March 1, 1948

*On adjacent drainage

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE

- Colorado State Engineer
- Wyoming State Engineer
- Utah State Engineer
- New Mexico State Engineer
- Montana State Engineer
- Nebraska State Engineer
- Colorado Experiment Station
- Colorado Extension Service
- Montana Experiment Station
- Utah Experiment Station

FEDERAL

- Department of Agriculture
 - Forest Service
 - Soil Conservation Service
- Department of Interior
 - Bureau of Reclamation
 - Geological Survey
 - National Park Service
- Department of Commerce
 - Weather Bureau
- War Department
 - Army Engineer Corps

PUBLIC UTILITIES

- Colorado Public Service Company
- Western Colorado Power Company
- Montana Power Company
- Public Service Company of New Mexico
- Denver and Rio Grande Western R. R. Company

MUNICIPALITIES

- City of Bozeman
- City of Denver
- City of Boulder

WATER USERS ORGANIZATIONS

- Poudre Valley Water Users' Association
- Arkansas Valley Ditch Association
- Colorado River Water Conservation District

IRRIGATION PROJECTS

- Farmers Reservoir and Irrigation Company
- San Luis Valley Irrigation District
- Santa Maria Reservoir Company
- Costilla Land Company
- Uncompahgre Valley Water Users' Association
- Wyoming Development Company
- Goshen Irrigation District
- Kendrick Project
- Pathfinder Irrigation District
- Salt River Valley Water Users' Association
- San Carlos Irrigation and Drainage District
- Twin Lakes Reservoir and Canal Company

Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

